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USSR Report

CONSTRUCTION AND EQUIPMENT

(FOUO 6/81)



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CONSTRUCTION

ORGANIZING ACCOUNTING IN CONSTRUCTION-INSTALLATION ASSOCIATIONS

Moscow BUKHGALTERSKIY UCHET in Russian No 6, Jun 81 (signed to press 4 Jun 81) pp 17-19

[Article by M. S. Pushkar', docent at Ternopol' Finance-Economics Institute: "Organizing Accounting in Construction-Installation Associations"]

[Text] The Soviet people have greeted the 26th CPSU Congress with a tremendous political and labor upsurge. Inspired by the resolutions of the congress, workers in our country have begun carrying out the 11th Five-Year Plan. We are faced with a great deal of work on further improving the economic mechanism so as to correspond better to the present level of productive forces during this period.

The CPSU Central Committee and USSR Council of Ministers Decree "On Improving Planning and Strengthening the Influence of the Economic Mechanism on Improving Production Efficiency and Work Quality" outlined the change-over of all construction ministries to a two- or three-link management system in 1979-1981. Construction-installation associations (trusts) will become the basic cost-accounting link in construction production. This restructuring of management will inescapably elicit considerable changes in the planning and accounting system both in the associations and in the production units.

Changes will occur foremost in the principles of management for associations which influence the scope and nature of the planning-accounting system: construction associations are being consolidated; the rights and responsibilities of their leaders are being broadened; the bulk of the production-economic functions are being centralized with a view towards the more efficient use of material, labor and financial resources; specialization of basic and auxiliary production is being deepened; specialized production facilities are being created to service the numerous production units of associations; specialized subdivisions are being formed in the associations based on technological functions; ties between science and production are being strengthened by creating scientific-production associations and by rapidly introducing scientific developments into production; administrative-management expenditures are being reduced as a result of more efficiently organizing the labor of engineering-technical workers and employees, conditions are being created for the more extensive introduction of automated management systems using the latest computer equipment.

Production construction-installation associations are being created which will have annual construction-installation work volumes of at least 50 million rubles for the

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general contractor, or with work volumes of at least 50 million rubles with consideration of adjustment factors for work complexity and labor intensiveness when doing individual types of construction-installation work with their own efforts as a subcontractor.

Associations are legal entities, carry out their activity on a full cost-accounting basis and have an independent balance and independent current and other bank accounts. Production units are denied legal independence, that is, they do not have the right to conclude agreements in their own names, cost accounting is incomplete and their rights are restricted. This will make its mark on organizing the planning and recording of production unit activity indicators. The main indicators of construction association activity will be: start-up of production capacities and projects; volume of commodity construction output; labor productivity growth; [observing] limits on the number of workers and employees; total wage fund; profit (or reduction in construction-installation work net cost); assignment on introducing new equipment; volume of deliveries of materials, machinery, machines and other material-technical resources.

Other indicators which assume an economic interest in attaining the common goal of improving production efficiency must be communicated to the production units comprising associations and operating on an internal cost-accounting basis. Such indicators might include: use of fixed and circulating capital; limits on numbers of workers; wage fund; labor productivity growth; production outlays.

It is inappropriate to plan the indicators of commodity output, profit and profitability for production units, since these indicators are not associated with the activity of the latter, but depend on the operation of the association as a whole. The efficiency of the production units is evaluated using such indicators as return on capital, labor productivity, expenditures per ruble of commodity output and percentage plan fulfillment for putting production capacities and facilities into operation.

One feature of the activity of production associations is the centralization of many production activity functions of the production units. Thus, for example, credit-calculation relations have been centralized and are being done entirely through production association accounts -- current account, production development fund account, loan accounts. Crediting can be effected for seasonal or other above-normative stocks of commodity-material values, for expenditures on introducing new equipment and improving technology, for seasonal shortfalls in depreciation deductions for major overhauls, for making up shortfalls in own circulating capital, and so forth. All production units are being changed over to a centralized procedure for crediting and calculations. In place of current, loan and other accounts, current accounts are being opened for them to pay wages, bonuses and make payments from the material incentives fund.

Contracts with suppliers to deliver materials, equipment and other goods for the production units are concluded by the production-technological equipment set-ordering administration, which has an independent budget and is a structural unit of the association. The UPTK [production-technological equipment set-ordering administration] is responsible for material-technical supply for all subdivisions of the production association. Calculations with suppliers are done using the association's current account, through the UPTK.

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The financial operations of the association and the production units comprising it are effected through the association current account (recording revenues from the sale of construction output, material values and fixed assets; transferring funds to the Stroybank to finance capital investments; calculations for redistributing circulating capital and profit within the system; paying supplier accounts for materials and services to associations which lack UTPK's; paying off loans and bank credits; centralized calculations with the budget for all types of payments; transferring funds to the current accounts of production units for issuing wages and for other expenses, and so forth).

For the production units, current accounts are being opened for: entering funds received from the association for paying wages, bonuses, temporary disability grants, payments on account and other payments; transferring taxes and withholdings from workers and employees, payments for municipal and printing services, payments for acquiring authorizations for trips to health resorts and recreation centers or for acquiring sporting goods using economic incentives and other funds.

Calculations with suppliers for small deliveries of materials and services to production units should be made independently, by check, from unlimited check books issued by the association and paid from the association loan account from work-in-progress accounts. All other calculations for materials goods must be made through the UTPK's.

Calculations for output, materials and services between production units are reflected in account No 79, "Intrasystem Accounts," and are not reflected in the current account of the association.

Calculations with the budget are reflected under centralized procedures for the association as a whole. Such calculations include payments for production funds, free carry-over profit, savings from lowering expenditures on maintaining the administrative-management apparatus. Production units have a separate balance which reflects such operations as calculations with the association on allocated fixed and circulating capital, production expenditures, expenses of future periods, monetary means, calculations with workers and employees, calculations with social insurance agencies and calculations with debtors and creditors.

Production units submit balances to the association at the established times; these are used as a basis for compiling a summary balance for the association as a whole. Operations on the state fund account (increase or decrease) are centralized and recorded in the association's accounting department, which also handles calculations with production units on allocated fixed and circulating capital, calculations with clients and suppliers in a production-unit cross-section, intrasystem accounts, recording current account operations, recording loans and credits, recording financial results, recording calculations with the budget, recording economic incentives funds, target financing and target receipts, recording diverted funds, recording the depreciation fund and its use, and others.

It should be noted that the creation of an association will permit improvement in planning and accounting, inasmuch as the association exercises methodological supervision and establishes a unified planning and accounting procedure in all production units. In connection with the creation of production associations in construction, the development of methods instructions on setting up planning and account in the

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construction-installation administrations in order to make them available to all associations and production units is now a top-priority task of the construction ministries. This will enable us to avoid mistakes and oversights in organizing planning and accounting in the associations.

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CONSTRUCTION

RISING CAPITAL CONSTRUCTION COSTS EXAMINED

Moscow VOPROSY EKONOMIKI in Russian No 10, Oct 81 (signed to press 2 Oct 81) pp 52-63

[Article by V. Kremyanskiy: "Change In Construction Cost"]

[Text] The development of capital construction in the 1970's did not fully meet the demands of intensifying the economy. The amounts and share of capital investments going not to increase economic potential, but to compensate for increased construction costs, grew constantly. In the 10th Five-Year Plan, given continuing growth in capital investments in a number of branches, there was an absolute reduction in the start-up of capacities, and the average yearly start-up of capacities for producing electric power, iron, steel and finished rolled metal, for coal mining and enrichment and for producing cellulose, paper, cardboard, knitwear and footwear was lower in 1976-1979 than in the Eighth Five-Year Plan.

The increased cost per unit of new capacity is one reason for the deterioration in indicators of specific capital investments on output and production capital-intensiveness.

Table 1.

indicator and branch of the national economy	1966- 1970	1971- 1975	1976- 1979	in percent of preceding period	
				1971- 1975	1976- 1979
specific capital investments on increment					
in gross output					
production sphere	1.39	1.72	2.53	124	147
including:					
industry	0.97	1.05	1.62	108	154
agriculture	3.39	7.45	9.67	220	130
construction	0.42	0.74	2.06	176	278
capital-intensiveness of gross output					
(at the end of the period)					
production sphere	0.83	0.93	1.05	112	113
including:					
industry	0.67	0.71	0.78	106	110
agriculture (average for the period)	0.91	1.20	1.57	132	131
construction	0.34	0.38	0.51	112	134

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The rate of increment in production capital investments exerts a great influence on the cost of output increment: in the Eighth and Ninth five-year plans, the average yearly rate of increment was about eight percent; in the Ninth Five-Year Plan, it dropped to 5.5 percent. In this regard, the rate of growth in capital investments to recompense withdrawals and maintain capacities must rise, since it depends largely on the amount of fixed production assets and their service life. In 1970, the value of fixed production assets was 531 billion rubles; in 1979 -- 1.076 trillion rubles (a 2.03-fold increase). Production capital investments increased from 61.9 to 106.9 billion rubles, 1.73-fold, during that period, that is, the rate of growth in capital investments lagged behind the rate of growth in fixed assets. This led to a reduction in the share of net capital investment going to increase assets and capacities. If the withdrawal of assets decreases in a given period, this is compensated for in a subsequent period by a higher rate of withdrawal. Consequently, the price of increasing a unit of capacity and output has a tendency to rise given lowering rates of growth in gross capital investments. The objective character of the increasing cost of increasing capacities and output is not associated with the increasing cost of new production capacities and nonproduction facilities or with growth in the capital-intensiveness of production. Determining the rate of cost increase per unit of capacity is complicated primarily by two factors: change in the branch structure of capacities start-up and price.

A comparison of branch capital investments and start-ups of traditional production capacities does not indicate that the cost of a unit of capacity is increasing, since the list of capacities is constantly changing, especially in types of production most associated with scientific and technical progress. Given overall growth of 1.7-fold in rolled ferrous metals during 1966-1979, the production of rolled low-alloy steels and rolled heat-hardened metal increased three-fold, production of thin-sheet, cold-rolled steel -- two fold, and production of curved shaped -- seven-fold. Given a 1.2-fold growth in machine tool production during 1970-1979, the production of machine tools with numerical preset control increased five-fold and that of automatic and semiautomatic lines -- 1.4-fold.

Using comparable or unchanged prices when calculating capital investment and fixed assets volumes does not enable us to judge change in the price of identical capacities made on the basis of the exact same planning resolutions. The distortion produced by comparable prices is indicated by recalculating the cost of capacities put into operation in 1951-1965 to 1969 prices. Thus, the valuation of capacities put into operation in 1951-1955 increases by 43.7 percent, that of those from 1956-1960 -- 36.1 percent, and that of those from 1961-1965 -- 17.4 percent. The price per square meter of total housing space increased 32.4 percent in 1969-1970 as compared with 1966-1968. After 1969, in spite of the fact that there were no significant price changes, the cost of a unit of capacity continued to rise. In housing construction, the price per square meter of usable space increased during 1971-1979 from 126.8 to 170.9 rubles, or 34.8 percent, which is 3.4 percent per year.

In industrial construction, the rate of increase in the cost of a unit of capacity we calculate to be 2.5 to three percent a year, somewhat more if the absolute and relative growth in unfinished construction is taken into account. The higher rate of growth in the cost of housing and nonproduction construction is to be explained by the lower share of equipment in the estimated cost of construction, a total of 5-10 percent, as compared with 35-40 percent in industrial construction. Calculations made on the basis of capital intensiveness and degree of updating of industrial

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fixed production assets also testify to similar rates of increase in the cost of industrial construction. During 1971-1979, capital intensiveness increased 1.7 percent per year, but in 1976-1979 -- 2.4 percent, that is, the rate of increase in the cost of a unit of capacity in industry reached approximately five percent a year in the 10th Five-Year Plan.

What are the reasons for the increasing cost of construction, even in comparable prices? In the Eighth Five-Year Plan, the cost of capacities increased by 15-20 percent more than when recalculated using indexes in comparable prices in connection with the higher level of estimated prices; environmental protection and labor protection expenditures increased; the share of capital investments directed into the northern and eastern regions increased. These additional expenditures were included in the initial base adopted for subsequent calculations of change in the cost of a unit of capacity. In the Ninth Five-Year Plan, the impact of the 1969 price increase continued to be felt, since the review of plans and estimates continued. In the 10th Five-Year Plan, a majority of these factors were no longer operative. To the contrary, the overall level of estimated prices was approximately two percent lower in the 10th Five-Year Plan than in the Ninth as a result of the reduction in equipment prices in 1973 and the 1976 lowering of the level of estimated prices for construction-installation work.

The cost of a unit of capacity is comprised basically of two parts -- expenditures on construction-installation work and expenditures on equipment. To reveal the reasons for the increasing cost of a unit of capacity, we need to analyze each of these components of its cost.

The highest level of increase in the cost of construction-installation work was in 1969-1970, when new unit rates and norms of general overheads and planned accumulations were established as part of estimated cost and construction worker wages were increased. Cost-increase indexes were set at 1.22 to 1.28 with consideration of these factors, somewhat higher for individual branches. However, the actual increase in cost turned out to be considerably greater.

Analysis enables us to establish the reasons for the outstripping increase in the cost of the passive portion of assets as compared with growth in estimated prices. Prices increased most -- 50-55 percent -- for frame buildings, as compared with 30-40 percent for other types of buildings. The increment in production space occurred basically through frame buildings, a square meter of which is 28 percent more expensive than in unframed brick, large-panel and prefabricated-slab buildings. The changeover in rural construction from buildings made of local construction materials to ones made of prefabricated reinforced concrete components resulted in a two-fold or greater increase in the cost of a unit of space.

The continuing development of capacities to produce prefabricated reinforced concrete components and the increase in their share of construction materials apparently leads to further growth in the cost of construction-installation work per unit of building space.

The rates of reduction in the production of cement and glass per million rubles of construction-installation work (in spite of the constantly growing share of glassed surfaces) testifies to the scale of the price increase per unit of construction output cost consumed. The rate of cost increase was highest in the Eighth Five-Year Plan. It dropped somewhat in the Ninth and rose again in the 10th (see Table 3).

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Table 2.

production of construction components and materials per million rubles of construction-installation work	1965	1970	1975	1979
prefabricated reinforced concrete				
(1,000 m ³)	1.58	1.70	1.72	1.75
construction brick (millions)	1.03	0.86	0.71	0.61
cement (1,000 tons)	2.04	1.91	1.84	1.78
window glass (1,000 m ²)	5.4	4.6	4.1	3.7

Table 3.

average annual rate of reduction in production, in physical indicators per million rubles of construction-installation work, in comparable prices	1966-1970	1971-1975	1976-1979
cement	-1.30	-0.75	-0.80
glass	-3.15	-2.30	-2.55

The following is one important reason for the increase in the cost of the passive portion of fixed assets. The policy adopted in the 1950's of extensively developing and widely using prefabricated reinforced concrete, given a low technical level of brick and monolithic concrete production, permitted a substantial rise in labor productivity in construction, in spite of the fact that it was inefficient to replace individual steel components. In the first stage of its industrialization, the increase in construction costs was considered a temporary phenomenon. However, no reduction in construction cost occurred over the following decades.

At present, significant achievements in brick production technology have enabled us to increase labor productivity in the branch. The use of progressive methods of working with concrete have increased the national-economic effectiveness of monolithic components as compared with prefabricated ones. Even in seismic zones, construction using monolithic reinforced concrete is most promising and profitable: capital investments in the production base are 30-45 percent lower, 20-25 percent less steel is used (as compared with large-panel houses) and overall expenditures are 7-8 percent lower. Nonetheless, monolithic reinforced concrete buildings are being put up only experimentally. The main indicators of technical progress continue to be the production and use of prefabricated reinforced concrete, degree of prefabrication, and so forth. As before, long-range developments anticipate the continued development of the prefabricated reinforced concrete industry.

The outstripping rates of development of the branch as compared with the rates of growth in the start-up of capacities and in construction-installation work volumes testify to the nature of the technical policy in construction. In 1976-1979, given an average annual rate of increment in gross construction output of 2.6 percent and in labor productivity of 2.2 percent, the rates of increment in fixed production assets were 10.5 percent, capital-intensiveness -- 7.6 percent, capital availability -- nine percent and machinery availability -- seven percent. Circulating capital increased from 19.3 to 78.7 billion rubles from 1970 through 1979, exceeding the annual volume of contractor work. Without taking unfinished construction production

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into account, circulating capital increased from 16.4 to 39.6 billion rubles, or 2.4-fold, with a construction volume growth of 1.6-fold, that is, circulating capital was growing 1.5-fold faster than the work volume.

The existing price-setting procedure facilitates growth in the materials-intensiveness and cost of construction (the procedure for determining the estimated cost of construction-installation work), under which general overheads are calculated for the entire sum of direct expenditures, and planned accumulations are calculated for the total direct expenditures and general overheads. Each ruble of increase in prices for materials or growth in material expenditures without any effort being put out by the builders provides them an additional 25-30 kopecks in the wage fund, approximately as much in profit, and 8-10 kopecks in the economic incentives fund. Growth in materials intensiveness is also facilitated by the decreasing (since the mid-1960's) attention paid to construction-installation work net cost. But in fact, material expenditures comprise more than half the net cost of construction.

The CPSU Central Committee and USSR Council of Ministers Decree "On Improving Planning and Strengthening the Influence of the Economic Mechanism on Improving Production Efficiency and Work Quality" outlines a change-over in industry to the indicator of net (normative) output. A similar price-setting procedure must be introduced into construction as well. However, the latest USSR Gosstroy normative documents¹ for the new estimated prices being prepared anticipate the old procedure for calculating general overheads and planned accumulations, which will lead to further growth in the materials-intensiveness and cost of construction and will not help eliminate differing work profitability in the initial and concluding stages of construction.

Profit and profitability level play an important role in the cost of a unit of capacity. Today, this economic lever stimulates not a reduction in the cost of a unit of capacity, but an increase in it. After estimated prices were introduced in 1969, profitability in construction dropped sharply: from 6.8 percent in 1968 to 15.9 percent in 1975 and 12.5 percent in 1979,² given a planned accumulations normative of six percent of the net cost of construction-installation work. Actual profit exceeds by 2.5-fold the normative of planned accumulations, which is one of the price-forming factors in construction output. During 1971-1975, contractor organization profits from releasing projects were 34.5 billion rubles, as compared with 14.4 billion rubles under the normative. During 1976-1979, profit was 33.2 billion rubles, as against a normative of 14.3 billion.

The high profit in construction distorts the actual cost of newly created fixed assets, lowers return on capital and increases the net cost of output in all branches

¹See: "On the Composition of Expenditures Relating to Normative Hypothetically-Net Output in Construction" (EKONOMIKA STROITEL'STVA, No 6, 1980, p 51).

²The reduction in profit and profitability in 1976-1979 resulted from the introduction as of 1 January 1976 of a construction-installation work estimated cost reduction factor equalling 0.991 for industrial construction and from a significant reduction in the increment in construction-installation work; in 1979, even the absolute amounts of such work decreased by 0.4 billion rubles, given continuing growth in fixed production assets and the availability of machinery to labor.

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of the national economy. During 1971-1979 alone, the cost of new fixed assets was overstated by 39 billion rubles for this reason. Given a substantial exceeding of normative construction schedules, so large an inflation of normative profit testifies to shortcomings in 1969 unit rates and to the fact that the reviews of estimated cost were unsubstantiated in a number of instances.

Normative profit must be achieved on the condition that all normative parameters are met, including construction schedules and quality, expenditures of materials and wages, use of machinery, and so forth. Unjustified profit growth results in the creation of conditions for high losses of construction materials, poorer use of construction machinery and equipment, significant lags in labor productivity growth behind growth in capital availability, and outstripping wage growth as compared with labor productivity. During 1965-1979, the average wage of workers employed in construction-installation jobs increased 87 percent, but labor productivity increased 72 percent. Since 1965, the average wage in construction has been higher than in other branches of the national economy.

The 26th CPSU Congress set as the basic task of construction increasing production potential on a new technical basis and installing housing, municipal- and cultural-services, social and cultural projects. The economic incentives mechanism must also facilitate this. However, over the past 10 years, bonus funds have grown not only faster than the introduction of fixed assets, but also faster than profit. At the same time, total bonuses for putting projects into operation have increased considerably more slowly than total bonuses and comprise about one percent of the wage fund, while they should be more than 10 percent, according to the normative, given that construction schedules are met.

Table 4.

	1965	1970	1975	1979
introduction of fixed assets, in billion rubles	51.4	76.4	105.6	120.1
(in percentage of 1965)	100	148.6	205.4	233.7
contractor organization profit for work released, in million rubles	1,651	4,772	8,487	7,907
(in percentage of 1965)	100	289	514	479
construction organization bonuses, in million rubles	387	1,113	2,197	2,658
(in percentage of 1965)	100	288	568	687
including for putting projects into operation, in million rubles	113	293	444	294
(in percentage of total bonuses)	29.2	26.3	20.2	11.1

The formation and use of economic incentives funds does not depend in practice on putting fixed assets into operation. What is being stimulated is not the start-up of assets, but profit, including so-called unrealized profit, that is, profit on unfinished construction. Moreover, it is now permitted to award bonuses through profit amounts established for putting production capacities and construction projects into operation in the form of an advance, given planned construction durations of more than six months. This is a deviation from the basic demand on bonuses, that they stimulate end results, and not individual intermediate stages of construction.

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The rise in the share of equipment expenditures in total capital investment volume and the increased cost of a unit of capacity have been the occasion for dissemination of the opinion that the main reason for the increasing cost of capacities is the outstripping growth in the cost of equipment as compared with its productivity. The rates of growth in equipment expenditures exceed nearly 1.5-fold the rates of growth in construction-installation work. In this regard, actual capital investments in equipment exceeded planned investments in the 10th Five-Year Plan.

The increase in expenditures on equipment is a natural phenomenon. Increasing intensification of the reproduction process requires qualitative change in the process of updating fixed assets. The growing amounts of capital investment are accompanied by increasingly smaller increments in fixed assets. This relates foremost to the active portion of fixed assets, whose share of fixed assets withdrawals is constantly growing.

It would seem that, given the increase in expenditures on equipment and on replacing old equipment with new and what many specialists consider to be more expensive equipment, given the constant growth in saturation with complex equipment, devices, automated lines, computer equipment, and so forth, the proportion of the active portion of assets in total fixed production assets must grow. However, that has not happened during the past 15 years. According to USSR Central Statistical Administration data, the proportion of the active portion of assets in industry was, at the start of each year (in percent):

1966	1971	1975	1976	1979	1980
38.2	39.2	38.2	38.1	38.5	39.8

Thus, whereas the cost of equipment did increase, the outstripping increase in the cost of construction-installation work and the passive portion of fixed assets did not permit the share of the active portion in total production assets to grow as it should have.

The relationship of the cost and productivity of new equipment being produced to replace old equipment is of important significance in the cost dynamics of a unit of capacity. In the opinion of a number of specialists, the outstripping growth in prices as compared with productivity has been a factor directly corresponding to growth in the cost of a unit of capacity. However, that does not take into account the fact that the cost of capacities consists of the active and passive portions of assets, and that the active portion -- machinery and equipment -- comprises only 40 percent of the total cost of the assets. Hence, the fact that the cost of equipment outstrips, within certain limits, growth in equipment productivity does not cause an increase in the cost of a unit of capacity. Thus, given a three-fold increase in the price of new equipment and a two-fold increase in productivity relative to that being replaced, the ratio of price to productivity is 1.5 : 1. But even this growth in the cost of a unit of equipment productivity does not cause the cost of a unit of capacity to rise in branches replacing old and less-productive equipment with new,¹ but more expensive equipment if the passive portion of the assets is not replaced.¹

¹This is obvious from a simple calculation: the cost of fixed assets prior to replacement was 100 units (60 passive + 40 active). After replacement, it was 180 units (60 + 120), but capacity increases two-fold in accordance with the increased equipment productivity.

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When old equipment is replaced with new, the overall cost of the fixed assets grows by 80 percent, but their productivity (capacity) increases by 100 percent. The cost of a unit of capacity (which coincides with capital intensiveness in this instance) decreases from 1 to 0.9, and the return on capital increases from 1 to 1.11. But this is true only if the productivity of the new equipment is fully used.

The appropriateness of replacing old equipment with new, more expensive and more productive, without increasing the cost of a unit of capacity, can be expressed in its general form by the formula:

$$\frac{N - 100}{S - 100} \geq P.$$

where N is the capacity of the enterprise after equipment replacement, in percent of base capacity; S is the price of the new equipment, in percent of the price of base equipment; P is the replacement equipment's share of overall fixed assets in terms of cost. The relationship of increment in enterprise capacity to increment in the cost of the replacement equipment must be not less than the replacement equipment's share of the overall cost of fixed assets.

The relationships presented for replacing base equipment with new and more expensive equipment provide an idea of how the type structure of fixed production assets must change. In the given hypothetical example, the share of the passive portion of the assets decreases from 60 to 33 percent after equipment replacement, and the share of the active portion increases from 40 to 67 percent. However, this does not remove the question of the necessity of constantly improving the relationship between the prices and productivity of new equipment. Lowering the cost of a unit of capacity is not facilitated either by the "Instructions on Procedures for Setting Incentive Surcharges to Wholesale Prices" approved by the State Price Committee on 27 November 1979,¹ which sets the price surcharge at 70 percent of the total impact. At the same time, the impact of that share of the total sum on equipment productivity growth averages about 15 percent. These enable us to consider efficient equipment even less productive than the base equipment, if the calculations show a savings of current operating expenditures.

A sample survey showed that price limits only substantiate the appropriateness of releasing new output, while prices for it are set in the traditional way -- net cost plus a set percentage of profitability. Profitability is set at the normative level, which is considerably below the actual level for output in use. In this regard, even incentive price surcharges do not make new output more profitable for the manufacturing plants. Replacing output in use with newer and less profitable output worsens enterprise economic indicators and consequently puts obstacles in the path of introducing it. Thus, above-normative profitability in machine building also has a negative impact on technical progress. Of course, the "profitability" of new output can be improved over that of output in use by setting a higher profitability for the new output, but that evokes a response throughout the entire reproduction chain: equipment increases in cost, the cost of new capacities increases, net cost increases in machine building and other production branches -- prices rise in machine building, and so on.

At the start of 1980, some 20-25 billion of the 106.4 billion rubles of unfinished construction was above-normative. The outstripping growth in unfinished construction

¹See: "Sovershenstvovaniya khozyaystvennogo mekhanizma" [Improving the Economic Mechanism], collection of documents, Izd-vo "Pravda", 1980, p 177.

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as compared with capital investment is an important factor causing the demand for capital investments in starting up production capacities and construction projects to increase.

Table 5.

	capital investment (billion rubles)		increment in unfinished construction billion rubles in percent of capital investment			
	1971-1975	1976-1979	1971-1975	1976-1979	1971-1975	1976-1979
total for the national economy, including production	493.0 392.0	500.6 406.9	24,175 19,320	29,768 23,436	4.9 4.9	5.9 5.9
of those:						
electric power engineering	17.0	15.2	1,005	1,455	5.9	9.6
coal industry	8.3	7.7	140	627	1.7	8.2
petroleum and gas	23.3	27.7	2,148	2,248	9.2	8.1
ferrous metallurgy	12.9	12.2	1,158	1,621	9.0	13.3
chemical and petrochemical	15.6	18.2	2,157	3,822	13.8	21.0
machine building and metal-working	37.7	42.5	4,031	1,808	10.7	4.2
timber, wood-processing, pulp and paper industry	7.7	7.4	525	617	6.8	8.4
building materials industry	8.5	7.4	404	95	4.8	1.3
light industry	7.0	6.8	140	120	2.0	1.8
food industry	11.6	10.5	241	398	2.1	3.8

As is evident from Table 5, the increase in the cost of construction during the Ninth Five-Year Plan due just to the increment in "unfinisheds" was 4.9 percent, and in the 10th -- 5.9 percent (13.8 and 21 percent, respectively, for chemical and petrochemical industry).

In working out plans, new construction is limited, and its estimated cost is set in significantly lower amounts than the start-up of fixed assets. However, total estimated cost increases each year, as does the volume of work subject to completion. Analysis shows that the increment in carry-over estimated cost, along with the increment in unfinished construction, it to be explained by the fact that there is considerably more new construction than was planned. In order to keep carry-over estimated cost at approximately a constant level, we need to reduce new construction projects by 8-10 billion rubles of estimated cost per year.

Along with reducing the new construction front, we should eliminate the possibility that it will be run under the cover of a review of plans and estimates. Thus, the Ministry of Electrification and Power Engineering, with the concurrence of the USSR Gosplan and Gosstroy, included the III and IV overfall GES's when it reviewed the Inguri GES estimate; the USSR Ministry of Ferrous Metallurgy included construction of two convector shops and an oxygen unit in the construction plan for Nizhne-Tagil' Metallurgical Combine, and so forth. Individual departments do large amounts of new construction, relying on plan review. In 1976-1979, the construction front was broadened by 75 percent for the Ministry of Automotive Industry, by 35 percent for the Ministry of Chemical Industry and by 33 percent for the Ministry of Ferrous Metallurgy through the re-approval of existing estimates.

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This practice conflicts with established procedure, under which reviewing plans in connection with further expanding and renovating enterprises after the first lines have been started up is done as in the case of new construction, and estimated for capacities and projects which have been put into operation must be closed, regardless of estimate limit carry-over. When this procedure is followed, total estimated cost more accurately reflects the actual amount of capital construction in the country.

Scattering means has to hamper the procedure set up in 1969 for planning on the basis of titles lists of new construction approved with a break-down by year in accord with construction duration norms. However, the ministries and contractor departments have failed to follow this procedure from the first year of construction, in spite of the normative allocation of resources. In the second and subsequent years, contractors and clients agree in the titles lists for carry-over projects to work volumes which are considerably smaller than was anticipated at the start of construction. The carry-over capital investments thus generated are directed into new construction, including through estimates with limit carry-overs.

A CPSU Central Committee and USSR Council of Ministers decree (of July 1979) confirms the previously established procedure for financing construction projects in strict accord with the titles lists for new construction and instructs the USSR Gosbank and Stroybank to finance construction sites and projects following the indicated procedure.

The increase in costs which occurs during the course of construction undermines the planning principle in economic activity, helps generate disproportions in the start-up of related capacities, and stretches out the construction time for those projects at whose expense the capital construction resources are being redistributed. Reviewing estimated cost basically concerns construction projects close to completion, and a shortage of capital investments for them creates objective conditions for failing to carry out the start-up plan, which in turn forces administrators to decrease the withdrawal of obsolete assets from the production process. Thus, the withdrawal factor was 1.5-fold lower in the 10th Five-Year Plan than in the Eighth. A reduction in withdrawal leads to additional expenses in operating obsolete means of labor, to diverting additional manpower to them, and to failure to meet labor productivity growth assignments and, correspondingly, output production growth assignments.

Analysis of the development of capital construction in the 10th Five-Year Plan permits the conclusion that none of its participants are economically interested today in lowering estimated cost, since activity is evaluated and bonuses are awarded on the basis of indicators determined by the estimate. The higher it is, the higher the evaluation and the bonus.

The dynamics of the components of the cost of a unit of capacity show that we need to direct our primary efforts towards lowering the cost of construction-installation work, of a unit of construction output consumed cost, of each square and cubic meter of building, of equipment installation, of a kilometer of utilities, roads, conveyance, and so forth, and not the million construction-installation jobs. Along with this, we need to continue improving equipment, increasing the usable impact of its use and raising the share of the impact of productivity growth.

L. I. Brezhnev pointed out at the 26th CPSU Congress that: "Solving the problems facing us and using the opportunities available to us depend largely on the level of leadership of the national economy, on the level of planning and management." In capital construction, the management level should obviously be raised along the following lines.

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In the area of technical policy, we need to make adjustments in the policy of the preferential development of prefabricated reinforced concrete, to change the indicators of technical progress in construction. It is not the degree of prefabrication and number of cubic meters of components per 1,000 square meters of space that must determine technical progress in construction, but the reduction in expenditures of social labor, reduction in the cost per square meter of space or unit of capacity while improving quality. Construction technology (prefabricated reinforced concrete components, wood components, monolithic components, and so on) can vary in each individual instance, but the result must be the same -- reduced cost per unit of capacity or unit of other useful impact.

The CPSU Central Committee and USSR Council of Ministers Decree "On Intensifying Work on Saving Raw Material, Fuel, Energy and Other Material Resources and Using Them Efficiently" recognized the necessity of approving in the five-year and annual plans, beginning in 1983, assignments on output (work) net cost and, as part of those assignments, limits on material expenditures in monetary terms per ruble of output (work). This will facilitate squeezing out materials-intensive prefabricated reinforced concrete components by other structural materials, which will in the end lower the cost of construction.

In the area of the management mechanism, one urgent task is that of bringing titles lists into line with available resources. We also need to fully inventory all construction sites and titles lists, to close estimates for finished capacities and projects which have been put into operation, and to establish the actual volumes of work to be done under approved plans and estimates. We should no longer permit estimated costs to be reviewed in connection with planning subsequent construction stages.

It is appropriate to forbid clients to pay for domestic equipment at above-list prices. Prices for new and updated types of equipment must undergo expert appraisal by the State Price Committee. We obviously need to restrict the influence construction organizations have on planners and clients at the design and agreement stage. Those questions which must be agreed upon should no longer include overall layout resolutions, building materials and components or size of start-up complexes. These questions must be resolved by the planner and client, and the planning resolutions adopted need to be agreed to only by state architecture-construction supervisory agencies.

The decree of 12 July 1979 points out that penalties outlined by law or by contract for failing to meet contract obligations must be imposed without reciprocal set-offs. The procedure for imposing these penalties in construction is established by the USSR Gosplan, jointly with the USSR Gosstroy, USSR Ministry of Finance and USSR State Committee for Labor and Social Questions. In our opinion, the financing banks should be entrusted with monitoring the imposition of penalties. Were this to be done, "mutual forgiveness" between clients, contractors, planners, suppliers of materials and equipment, and others would disappear.

In the area of the economic mechanism, new estimated prices are called upon to ensure a net cost of normally operating construction organizations and profit for branch expanded reproduction in conformity with the planned volumes of construction-installation work and economic incentives funds with consideration of the fact that bonuses for putting fixed assets into operation are included in the construction estimates. Payments for credit must be taken into account at the level anticipated for putting assets into operation under the schedules established by the plan. All additional

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construction organization expenses caused by failure to follow the normative production process, including payment of higher interest in connection with delay in meeting construction schedules, must not be included in estimated prices. In our opinion, there is no need to increase the cost of construction and create an accumulation fund for the expanded reproduction of other branches of the national economy by inflating the cost of fixed assets in this branch.

Prices for construction-installation work should be developed as applicable to prices for industrial output in accordance with the decree of 12 July 1979, that is, in terms of both gross and net (normative) output. But even the prices for gross output must not include general overheads and planned accumulations for the cost of materials. Of course, this will require the development of new norms for general overheads, planned accumulations and other expenditure limits corresponding to the technical and organizational level of construction production.

We should obviously also review the "Provision on Awarding Bonuses for Putting Capacities Into Operation" (of 11 September 1979) in the direction of increasing the interest of all capital construction participants precisely in the start-up of capacities, and not in carrying out individual work stages, and we must change the ways in which bonus funds are used. The bonus fund can be formed using several factors (profitability, reduction in work net cost, bonus sums anticipated for putting projects into operation, and others), but it must be used only in connection with the start-up of fixed assets and capacities within the time periods established by the plan. Start-up bonuses could be paid on another basis than quarterly, but they would become purposeful and important to workers of construction organizations, clients and planners. Such a bonus system would permit acceleration of the schedules and operation of construction start-up complexes, improve their quality, and lower personnel turnover in construction.

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BUILDING MATERIALS

BOOK EXCERPTS: BUILDING MATERIALS

Moscow STROITEL'NYE MATERIALY [Building Materials] in Russian 1980 (signed to press 20 May 80)

[Annotation, foreword and introduction from book by B. V. Sysoyev, A. S. Shcherbakov, and L. V. Golovanova, Izdatel'stvo Lesnaya Promyshlennost, 6,500 copies, 192 pages]

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Sysoyev, B. V., Shcherbakov, A. S., Golovanova, L. V., Building Materials: A Textbook for Technical Schools--Moscow Lesnaya Promyshlennost', 1980--192 pp.

Contains data about the properties and conditions for utilizing the building materials that are extensively used in industrial and civil construction including during the erection of buildings and structures for various purposes in the timber industry. Special attention is given to adhesive (organic and non-organic) concretes, wood and other materials.

Intended for students in technical schools with the specialty "Construction and Utilization of Logging Roads" (1217); can be used by workers in construction organizations in the timber industry.

21 tables, 43 illustrations, bibliography--6 references.

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Foreword

The huge scale and rates of growth of construction in the Soviet Union are causing a corresponding demand for building materials and for an increase in their production.

The USSR construction industry has a powerful building materials, products, and components industry at its disposal. The Soviet Union occupies first place in the world for the production of cement, concrete, glass and a number of other materials and products. The huge volume of building materials being used requires their efficient and economical consumption since even a small percentage of savings as a result comprises substantial sums and makes it possible to erect additional individual structures or whole complexes.

The efficient and economic consumption of building materials depends on knowledge of the varieties of building materials, their properties and conditions for use. Proper storage and transportation does not play an unimportant role in economizing materials.

Construction in the timber industry is characterized by the fractionation of construction projects often with small amounts of work for a project, remoteness from construction industry centers, the complexity (and sometimes seasonal nature) of deliveries of materials to projects, etc. The specific nature of construction requires effectiveness in solving the problems of using this or that building material and knowledge of the existing products list, the properties of materials, the conditions for use, transportation and storage.

That which is set forth above defined the contents of the textbook whose goals are to describe the varieties of the primary building materials that are being extensively used, their physical and mechanical properties, the conditions associated with this for using them in structural components and also transportation and storage problems.

The textbook was compiled in accordance with the program of the course "Building materials" for special mid-level institutions of learning for specialty No 1217, "Construction and Utilization of Logging Roads."

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The foreword, introduction and chapters 4 to 7 were written by B. V. Sysoyev; chapters 1 and 8 to 12 by L. V. Golovanova; chapters 2, 3, 13 and 14 by A. S. Shcherbakov.

Introduction

The plans for the economic and social development of the USSR specify the implementation of a large program of construction work in the country. In order to build at such a scale, which has no equal in any country in the world, it is necessary to ensure a further comprehensive development of the building materials industry--the primary production base for construction. This sector must substantially increase the output of its products and, along with this, achieve considerable improvements in its structure by means of expanding the mass production of new materials, efficient prefabricated elements, and light, economical, large size components and products of superior quality that will provide an improvement in the level of industrialization, a reduction in material consumption and the cost of construction and also durability, comfort and architectural expressiveness in buildings and structures.

Man already began to use building materials in ancient times. Lime, gypsum, stone and brick were known to our remote ancestors. Thus, archeological excavations show that people already obtained clay brick in the territory of the Soviet Union during the fourth century. However, industrial production--the first brick molding plants--began in the 19th century. The intensive progress in construction during the last century and especially during recent decades was caused by the development and creation of new building materials, the purposes of which more completely satisfy the needs of builders. Such materials make it possible to erect complete and intricate structures.

Progress in creating new building materials and the improvement of existing ones continues unabated. At the present time builders have the most diverse building materials at their disposal with a great variety of properties. This imposes the obligation of using them properly and economically (meeting the technological requirements of the building or structure and providing the durability required, and the quickness of erection and minimal cost that is necessary).

The goals of the building materials course, in accordance with the program with which our textbook was drawn up, is the study of the varieties and properties of building materials, methods of determining their properties, and also the conditions for skillfully and more efficiently using this or that material in buildings and structures.

According to the tradition which has become accepted on the basis of many years of experience in taking the course, the first chapter of the textbook is devoted to the basic properties of building materials and the method for determining them. Individual properties that are inherent in this or that building material are cited in corresponding sections. Knowledge of the basic properties of building materials is necessary for an objective and comparative evaluation when using them in buildings and structures. Laboratory work and research can be planned and conducted on the basis of this section.

Subsequent chapters contain, in the generally accepted order, a description of the varieties and properties of natural rock and ceramic materials, adhesive mineral

substances, concrete and reinforced concrete, building mortars, artificial rock materials derived from adhesive mineral substances, organic adhesive substances and materials derived from them, building materials derived from polymers, heat and sound insulating, paint and varnish, finish, glass, smelted, and timber materials and metals.

Special attention is given in the textbook to the properties of building materials and the conditions for their use. Problems in the technology of their production are touched upon very briefly and only when necessary. The technology of building materials is a special subject which should be studied in a separate course.

The sequence of presenting the materials in the textbook corresponds to the course's program. When necessary this sequence can be changed during the course of study.

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